



LOW-CARBON AGRICULTURE TRANSITION MECHANISM (LATM)

INSTRUMENT ANALYSIS
SEPTEMBER 2023



Low-Carbon Agriculture Transition Mechanism (LATM)

LAB INSTRUMENT ANALYSIS

September 2023

DESCRIPTION & GOAL

A unique mechanism to accelerate climate transition in agriculture by offering adequate long-term loans to small and medium-sized farmers while guaranteeing a minimum income and technical assistance.

SECTOR

Land Use/AFOLU, Sustainable Agriculture

FINANCE TARGET

Private capital investors, development financial institutions (DFIs), and philanthropies

GEOGRAPHY

Brazil

The Lab identifies, develops, and launches sustainable finance instruments that can drive billions to a low-carbon economy. The 2023 Lab cycle targets two thematic areas (gender and adaptation), three geographic regions (Brazil, India, and East & Southern Africa), and one global open slot.

AUTHORS AND ACKNOWLEDGEMENTS

The authors of this brief are Phillipe Käfer and Pedro de Aragão Fernandes.

The authors would like to acknowledge the following professionals for their cooperation and valued contributions, including the proponents Martha de Sá (VERT Capital), Paula Peirão (VERT Capital), Gilberto Ribeiro de Oliveira Filho (VOX Capital), Daniel Brandão (VOX Capital), Robson Martin (VOX), Marina Siqueira (VOX Capital), William Costa (VERT Capital), João Pontedeiro (VOX Capital), Ricardo Amatucci (Vox Capital); and the working group members: Abyd Karmali (BoFA), Letícia Mello (Wald Advogados), Julieda Puig (HSBC), Thiago Gomes (GEF Capital), Gabriela Mugnol (GEF), Elizabethta Albernaz (FCDO), Jeromine Bertrand (BEIS), Bruno Bacchin (QAM), Bruno Gonçalves (QAM), Luiz Quaglio (BV), Tomas Kovenski (TNC), Marcos Gambi (TNC), Julio Guiomar (BNDES), Luisa Lembi (BDMG), Patrícia Genelhu (BTG), Mariana Sang (BTG), Jonathas Couri (A&M), Fernando Laranja (Kaete), Felipe Borschiver (Palladium Group), Gustavo Pinheiro (Instituto Clima e Sociedade), Maud Chalamet (FCDO), Natália Leite (TNC), Georgina Beasley (NZLA), Luke Delaisse (NZLA). The authors would like to acknowledge the contribution of the legal experts: Heike Schmitz (HSF), Konstantin Hoerner (HSF), and Sophie Dijoux (HSF).

The authors would also like to thank Barbara Buchner, Ben Broche, Jonathan First, Kathleen Maedar, Ricardo Narvaez, Rosaly Byrd, Angela Woodall, Elana Fortin, Josh Wheeling, Júlio Lubianco, and Samuel Goodman for their continuous advice, support, comments, design, and internal review.

The Lab's 2023 programs have been funded by the German, Canadian, US, and UK governments and Bloomberg Philanthropies. [Climate Policy Initiative](#) (CPI) serves as Secretariat and analytical provider.



SUMMARY

Brazil is the fifth largest emitter in the world (Ritchie, Roser & Rosado, 2022), having emitted 2.42 billion gross tons of CO₂e in 2021, with land conversion and agriculture emissions representing 49% and 25%, respectively (SEEG, 2022). Reducing agriculture-driven greenhouse gas emissions and protecting carbon sinks is vital to ensuring a net-zero future for Brazil and the world. The urgency of this point is further reinforced by the alarming deforestation rates the country is currently experiencing. Mechanisms that ensure a stable transition to sustainable agricultural practices are crucial to reducing deforestation and making agriculture less carbon-intensive while guaranteeing Brazil's food security.

The VOX VERT Low-Carbon Agriculture Transition Mechanism (LATM) aims to channel blended finance investments to facilitate the adoption of sustainable agriculture practices and accelerate sector decarbonization in Brazil by leveraging a unique bundled product – a revolving debt program with long-term loans, a transition guarantee facility, and technical assistance. To create a feasible pipeline and develop a robust financial model, this key aggregated product will be offered under four specific credit lines: Pasture Recovery, Sustainable Livestock Intensification, Integrated Systems, and Agroforestry and Bioeconomy. This mechanism aims to avoid and remove over 187,245 tons of carbon equivalent emissions per year.

The Lab Secretariat recommends endorsement of this instrument as it meets the Lab's four endorsement criteria:

- **Innovative:** The transition guarantee facility is an innovative way to address the pipeline development from loans to investments facilitating agricultural shifts. The mechanism increases farmers' confidence to use the loan proceeds to transition to sustainable agriculture practices. A portfolio approach of having four credit lines in different types of agricultural transformation also leads to risk management and fair interest rate attribution within the model.
- **Financially Sustainable:** The portfolio approach provides competitive lending rates and concessional capital for risk mitigation. Although running the mechanism depends on concessional capital and grants, it aims to reduce this dependency upon investors' recognition of the model and the potential inclusion of alternative cash flows.
- **Catalytic:** A pilot has been developed to test the mobilization of private capital and impact deliverables into each proposed credit line. It will advance into a commercial phase to include the portfolio approach and the transition guarantee facility. At that phase, the instrument will avoid 187,245 tons of CO₂e emissions/year. Once the commercial phase succeeds, it can engage in a scale-up phase with minor adjustments, considering pastureland degraded conditions and the demand for deforestation-free products.
- **Actionable:** Proponents VOX Capital and VERT Capital are long-standing impact investor and securitization entities, respectively, with a well-established track record of agribusiness structures and successful venture capital experience generating positive financial results and impact in Brazil. A debt mechanism for pasture restoration and pilots related to bioeconomy and sustainable livestock are building up a track record for the mechanism.

TABLE OF CONTENTS

CONTEXT.....	5
CONCEPT	6
1. Instrument Mechanics	6
1.1 MECHANICS	6
1.2 VALUE PROPOSITION FOR PRIVATE INVESTORS.....	7
2. Innovation.....	8
2.1 Barriers Addressed: Access to Credit, Opportunity Costs, Technical Expertise.....	8
2.2 Innovation: Income Guarantee for transitioning to Sustainable Agriculture	10
2.3 Challenges to Instrument Success.....	12
MARKET TEST AND BEYOND	13
3. Implementation Pathway	13
3.1 Pilot Phase	13
3.2 Commercial Phase.....	16
3.3 Scale-up phase	16
4. Financial Impact and Sustainability	16
4.1 Quantitative Modeling	16
4.2 Private Finance Mobilization and Scale-Up Potential.....	17
5. Environmental and Socio-economic Impact	18
5.1 Environmental Impact	19
5.2 Social and Economic impact	20
NEXT STEPS	20
REFERENCES	21
Annex I – LATM Commercial Partners	23

CONTEXT

Low-carbon agriculture will be crucial in Brazil's plan to address deforestation in the Amazon, Cerrado, and Atlantic Forest biomes. It will also reduce emissions, increase productivity, and allow Brazil to meet its climate goals. However, these initiatives often lack public or private funding.

Brazil is the world's fifth largest emitter of greenhouse gases (Ritchie, Roser, Rosado, 2022), and its emissions increased by 12.2% in 2021, reaching 2.42 billion gross tons of CO₂e. Deforestation accounts for 49% of Brazil's emissions, while agriculture represents 25%. Cattle ranching is a major contributor to deforestation and emissions in Brazil, as its productivity is only 1.5 head per hectare of pastureland (MapBiomass 2023; IBGE 2021). While Brazil stands out with a stocking rate that's more than double the European Union average (0.7 head per hectare - Eurostat, 2023), it's important to note that certain EU countries, such as the Netherlands (3.4), Malta (3.2), Belgium (2.7), and Cyprus (1.7), have higher stocking productivity rates than Brazil.

Despite this, Brazil has pledged to reduce greenhouse gas (GHG) emissions by 50% below 2005 levels by 2030 in its revised Nationally Determined Contribution (NDC) (Brazil, 2022). As a part of this goal, it intends to reforest 12 million hectares of forests, restore 15 million hectares of degraded pastureland, and increase the adoption of integrated (crop-livestock-forestry) systems by 5 million hectares by 2030 (Brazil, 2015).

To meet these goals, Brazil's main agricultural policy framework – *Plano Safra*, or the National Crop Plan – prioritized sustainability for the first time in 2023 by offering discounted interest rates based on environmental criteria. Although essential definitions remain for the policy to effectively impact the transition to low-carbon agriculture and the protection of native vegetation (Oliveira, Souza & Stussi, 2023), it remains to be seen if the discounted rates will be enough incentive for adopting sustainable practices. However, the government earmarked BRL 341 billion (USD 66.1 billion¹) for *Plano Safra*, which covers 30-40% of the yearly agricultural sector credit demand. The supply chain and commercial banks amount for the remaining, and, more recently, additional funding has been provided through the development of capital markets.

One such initiative is the Low-Carbon Agriculture Transition Mechanism (LATM), which aims to limit deforestation in Brazil's largest biomes – Amazon, Cerrado, and Atlantic Forest (comprising 50%, 23%, and 13% of the country's area, respectively – Mapbiomas, 2023), while furthering agriculture's low-carbon transition.

Over ten years, LATM will target a cumulative USD 100 million of loans to small and medium-sized farmers, up to 78,000 hectares. These will fund four main activity streams: (1) Pasture Recovery, (2) Sustainable Livestock Management, (3) Integrated Systems, and (4) Agroforestry Systems and Bioeconomy Non-Timber Forest Products. LATM is estimated to remove over 187,245 tons of emissions per year.

¹ Official FX conversion rates for BRL to USD from World Bank. Available [here](#). Exchange rate (Year – BRL/USD) : 2022 – 5.16.

CONCEPT

1. INSTRUMENT MECHANICS

A two-level funding mechanism to accelerate the transition to low-carbon agriculture in Brazil, providing farmers with a transition guarantee facility, long-term lending, and technical assistance.

1.1 MECHANICS

The Low-Carbon Agriculture Transition Mechanism is a financial structure to accelerate Brazil's transition toward sustainable agriculture. It includes instrument-specific credit lines to accelerate the leading practices related to low-carbon agriculture, as outlined below.

Table 1: Credit Lines for Sustainable Agriculture

Credit Lines	Biome	Description
Pasture Recovery	Cerrado	Recovery of degraded pastureland transitioning to cropland
Sustainable Livestock Intensification	Cerrado	Credit line to enable the transition of low-productivity cattle areas to sustainable livestock management
Integrated Systems	Amazon, Cerrado and Atlantic Forest	Credit line to enable a whole farm management system that aims to deliver more sustainable agriculture.
Agroforestry and Bioeconomy	Amazon and Atlantic Forest	Increase productivity and expand current agroforestry practices and non-timber forest products (NTFPs)

These credit lines are provided to farmers committed to deforestation and conversion-free from 2020 onwards, based on IFACC criteria, while complying with the European Union (EU) non-deforestation regulation No 995/2010.

To pursue this transition, the mechanism has three components:

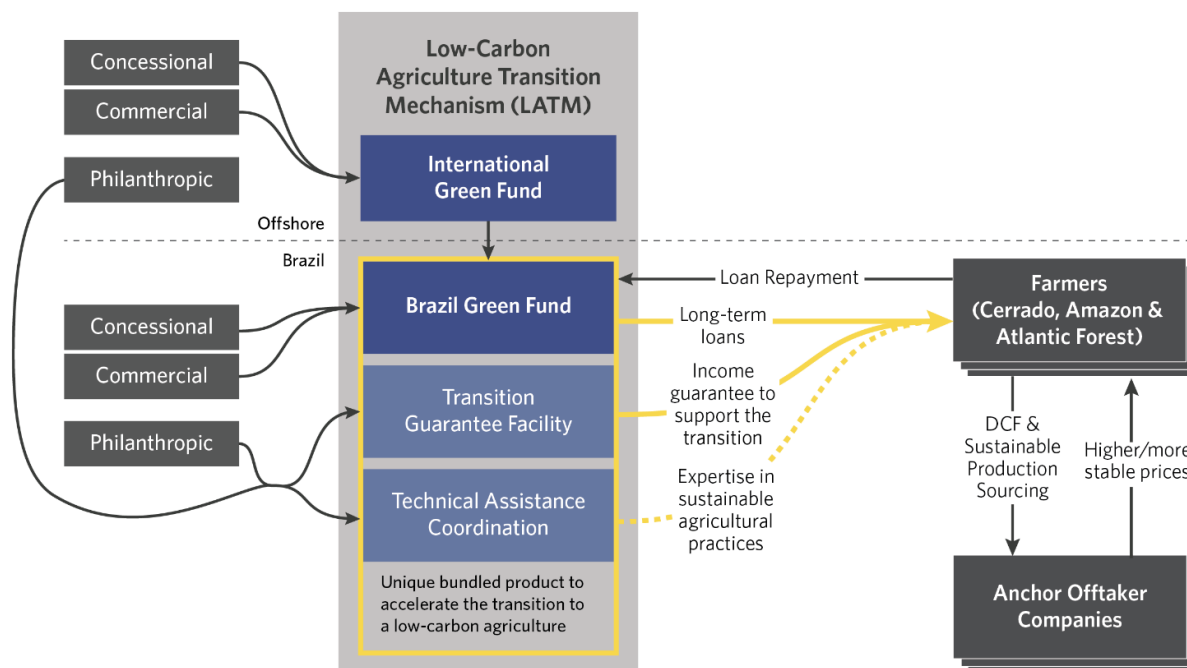
- **Transition Guarantee Facility.** Producers transitioning to sustainable agriculture from low-productive cattle or soy to sustainable livestock management or low-carbon agricultural systems have their income guaranteed if they experience low productivity and revenue, as determined by historical personal and regional data.
- **Revolving Debt Program.** A ten-year structure to provide loans for small and medium-sized farmers based on the referred credit lines and specific transition characteristics, as verified by the technical assistance.
- **Technical Assistance Coordination.** Vegetation, climate, and soil conditions are diversified across the mentioned biomes. Considering this heterogeneous environment, the proponents organized the mechanism as having one Technical Assistance Coordination and local partners to deliver the specific support related to the regions and types of agricultural practices.

A two-level structure for funding the mechanism was included to facilitate the mobilization of local and international capital for supporting the Brazilian transition to a low-carbon economy.

- **Offshore Green Fund.** Fund to be incorporated in a foreign currency jurisdiction to qualify as a green fund under the applicable regulation (e.g., Sustainable Finance Disclosure Regulation – SFDR) and attract international private investors sourcing sustainable agricultural and forest products.
- **Brazil Green Fund.** Fund to be incorporated in Brazil under the Brazilian Securities Commission Resolution no. 175/2022 to qualify as a green fund. Investments from the Offshore Green Fund or other local investors fund this mechanism. This could take the form of a bond if a simplified structure is adequate to run the pilot.

Figure 1 provides a structured overview of the instrument mechanics.

Figure 1: Instrument Mechanics



1.2 VALUE PROPOSITION FOR PRIVATE INVESTORS

Private investors and commercial partners can leverage LATM by:

- Matchmaking with consumer preferences on sustainably sourced products
- Improved socio-environmental risk mitigation and compliance with current non-deforestation laws and regulations
- Reduced due diligence cost
- Optimization of current sustainability programs through investments in this mechanism

On the other hand, the mechanism can benefit from these partners by:

- Pipeline development
- Providing technical assistance
- Reducing the dependency on traditional donors
- Investing in the funds

The proponents are building relationships with specific commercial partners for each credit line. These companies were considered to have direct financial materiality with the transition to sustainable agriculture. By financial materiality, we considered the costs and benefits associated with a commercial interest in sourcing sustainable products.

Furthermore, the instrument has been developing partnership agreements with the companies provided in Annex I (note that some are confidential at the time being).

2. INNOVATION

First-of-its-kind financial instrument to support sustainable agricultural transition by offering income guarantee based on a portfolio risk management approach.

2.1 BARRIERS ADDRESSED: ACCESS TO CREDIT, OPPORTUNITY COSTS, TECHNICAL EXPERTISE

Credit access is a major barrier to Brazilian agriculture. The agricultural sector has an estimated demand for credit of BRL 1 trillion² (USD 193.4 billion), with BRL 750 billion (USD 145.3 billion)³ necessary for funding seasonal crops (Agroanalysis, 2022). Plano Safra (Brazilian Government National Agricultural Plan) is the primary funding source for farmers to overcome hardships and uncertainties, and, at its core, it seeks to boost agricultural productivity, ensure food security, and foster rural development. However, the plan covers 30%-40% of the agricultural sector's annual credit demand. The remaining funding is supplied by farmers' resources, the supply chain, commercial banks, and, more recently, through capital markets.

Generally, traditional agriculture farmers must pay upfront costs that cannot be recovered until after harvest. Based on CPI research, "if farmers get good weather and overcome natural risks, they are still susceptible to price risks when they bring their production to the market. Therefore, access to appropriate financial services can increase agricultural productivity by allowing farmers to make better production decisions and manage their risks. In Brazil, however, the complexity of the rural credit system and the scarcity of insurance instruments often add to farmers' financial challenges" (CPI, 2020). **Therefore, increasing access to credit is imperative for agriculture in Brazil and even more so for sustainable agriculture.**

Historically, sustainability was associated with specific lines of credit aimed at investments, representing 1,8% of all resources deployed by Plano Safra in 2022 (CPI, 2023). The 2023 Plano Safra placed sustainability as a part of providing the loans for the first time by creating interest rate discounts based on environmental criteria, applied to credit lines that cover the costs associated with agricultural production, representing the most significant part of rural credit. Although the change could affect the whole working capital rural credit universe, it is still necessary to define what sustainable practices should be incentivized (and how to measure them) for the policy to effectively impact the transition to low-carbon agriculture

² Numbers estimated by proponents using data on use of soil and production costs from the Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics – IBGE).

³ Official FX conversion rates for BRL to USD from World Bank. Available [here](#). Exchange rate (Year – BRL/USD) : 2022 – 5.16.

and the protection of native vegetation (Oliveira, Souza & Stussi, 2023). It remains to be seen if the discounted rates will be enough to incentivize farmers to adopt sustainable practices.

The second barrier is related to the lack of access to credit: **opportunity costs between degraded land restoration and new forest conversions**. Unproductive pasturelands are common in Brazil. In 2021, Brazil reached 224.6 million cattle heads, an all-time high (IBGE, 2021), covering 149.6 million hectares of pasture, or 1.5 cattle head/ha. While the industry continues to grow, the vast majority of the land set aside for cattle (95.5 million hectares or 64% of all pasturelands) comprises degraded areas (MapBiomass, 2023).

Farmers are tasked with the important consideration of restoring high-value lost biomes and weighing the potential trade-offs associated with foregoing the benefits of the lower-value biome that is being replaced. Rural credit impact varies across Brazil's biomes, given different vegetation types, agricultural production, crop potential, climate, and soil type. Evidence shows that while increased access to credit generates higher agricultural production in most biomes, the positive effects are larger in the Amazon and the Cerrado biomes (CPI, 2021), boosting agricultural activity while reducing pressures driving deforestation. This indicates that access to credit, on average, compensates for the opportunity cost of foregoing traditional agricultural practices.

Deeply connected with the previous barrier is the **lack of technical capacity**. It plays an important role in adopting sustainable agriculture in Brazil, as farmers generally lack the technical knowledge to foster sustainable practices.

LATM addresses the main barriers preventing financing from reaching sustainable agriculture and forestry-based product value chains. The barriers, as well as the mechanism strategies to overcome them, are described below:

Table 2: Market Barriers and LATM Added Value

Barrier	LATM Added Value
Access to credit	The fund will target a cumulative USD 100 million of loans to small and medium-sized farmers, furthering agriculture's low-carbon transition, who traditionally cannot fully finance themselves with government-subsided loans. These will fund four main activity streams: (1) Pasture Recovery, (2) Sustainable Livestock Management, (3) Integrated Systems, and (4) Agroforestry Systems and Bioeconomy Non-Timber Forest Products.
Opportunity costs between degraded land restoration and new forest conversions	<ul style="list-style-type: none"> (1) Long-term loans with competitive interest rates will be adjusted to address the necessary timeframe for the investments needed to facilitate the transition utilizing the credit lines. (2) The portfolio risk management approach made it possible to model lower interest rates to micro-producers on agroforestry and NTFP practices. (3) The Transition Guarantee Facility will smooth income fluctuations during the first three years of the transition period, reducing their opportunity cost and accelerating the transition at scale.
Technical capacity on pastureland recovery, new practices, and impact reporting	The technical assistance component provides targeted support to farmers transitioning to more sustainable and resilient practices. It is present from the beginning and accompanies the producer in the process as a whole. This support could also facilitate access to further climate-related investments. It also provides information for the use of proceeds on an individual basis, as well as the soil carbon baseline.

2.2 INNOVATION: INCOME GUARANTEE FOR TRANSITIONING TO SUSTAINABLE AGRICULTURE

LATM's main innovation consists of the Transition Guarantee Facility, which will be the first income guarantee in Brazil of a kind for the sector.

The Transition Guarantee Facility provides an income guarantee for producers who opt for a transition from low-productive cattle or soy to sustainable livestock management or low-carbon agricultural systems, covering the farmer's opportunity cost that this may entail.

With technical assistance, the amount producers can access in case of income loss for that year is established at the beginning. To calculate this amount, two scenarios are considered each year: one in which the producer maintains their current management model – considering historical and regional data on revenue and productivity – and another in which they transition to sustainable production practice. The potential income difference between these two models, if any, will be the maximum amount the producer can access at the end of the year.

VOX and VERT research indicates that the first three years of transition represent the period of highest opportunity cost, with the first year being the most critical, followed by progressive reductions in subsequent years. Therefore, in the adopted model, we consider an opportunity cost factor that influences access to the facility, broken down by each system.

Technical assistance will periodically monitor the process and elaborate a report, verifying if the adopted transition protocol has been implemented correctly. Once confirmed, the producer will remain eligible for the Transition Guarantee Facility.

Producers transitioning to sustainable agriculture will have their income guaranteed if they experience low productivity and revenue, as determined by historical personal and regional data. Adopting this mechanism aims to reduce farmers' aversion to sustainable practices due to unfamiliarity. By smoothing income fluctuations, the mechanism positions itself as the first income transition guarantee in the Brazilian market, addressing the important barrier of opportunity costs of foregoing unsustainable practices.

Complementing the main innovation, the mechanism will provide four credit lines using a portfolio risk management approach. As discussed, this portfolio approach was modeled to leverage lower interest rates for agroforestry systems and bioeconomy, activities usually more dependent on concessional capital when funded separately, thanks to profits from the other three credit lines.

Table 3 summarizes Comparable Rural Credit Instruments in place in Brazil for fostering sustainable agriculture and how LATM differentiates itself from them.

Table 3: Comparable Rural Credit Instruments

Similar instruments	Overview	LATM's added value
<p>Plano Safra (Brazilian Government National Agricultural Plan)</p>	<p>The plan typically includes provisions for different credit lines with subsidized interest rates depending on the modality, the size of the producer, and the loan's destination: cost, investment, industrialization, or trade.</p>	<p>The instrument complements Plano Safra by focusing on farmers who cannot fully finance themselves with government-subsided loans or who do not access the credit lines at the pace needed and addressing gaps for additional investments for an appropriate sustainable transition.</p>
<p>Amazônia Sustainable Supply Chains Mechanism (Lab Alumni 2021)</p>	<p>Debt bond mechanism that leverages offtake agreements for forest-compatible products to provide upfront finance, technical assistance, and structural community resources that catalyze sustainable bioeconomy (The Lab, 2021).</p>	<p>A similar offtake model will be developed on the Amazon biome for agroforestry and bioeconomy stream. A minimum productivity income guarantee facility will smooth income fluctuations.</p>
<p>CRA Tabôa (Grupo Gaia)</p>	<p>Debt bond mechanism to provide fair credit for family farmers to produce cabruca cocoa with technical assistance from Tabôa, promoting high-quality agroecological production in the southeast of the state Bahia (Atlantic Forest).</p>	<p>LATM's target market will cover the southeast of Bahia and other biomes. It will cover small and medium-sized farmers with different types of production.</p>
<p>Conexus Impact Fund (Lab Alumni 2020)</p>	<p>A fund designed to facilitate access and redirect federally subsidized credit targeted at family farmers (PRONAF) to sustainable production systems that keep forests standing (The Lab, 2020a).</p>	<p>LATM's target market is focused on small and medium-sized farmers who are not eligible for PRONAF due to their size.</p>
<p>Vox Regai 15.3 Regenerativo Fiagro (Vox Capital)</p>	<p>A fund designed to acquire degraded pasture land, restore it, and obtain returns based on selling these farms.</p>	<p>LATM's credit lines include the restoration of degraded pastureland, but its returns do not come from the buying and selling these lands.</p>
<p>Sustainable Agriculture Facility (Lab Alumni 2020)</p>	<p>Five-line credit bundle with tailored timeframes for different ICLF uptake stages that cater to the risk and cash flow profile of ICLF systems (The Lab, 2020b).</p>	<p>LATM will have additional credit lines to agroforestry systems and bioeconomy and will have the transition facility.</p>
<p>Responsible Commodities Facility (Lab Alumni 2018)</p>	<p>Bond debt instrument for crop financing and land restoration loans for Cerrado soy producers, combining lower interest rates and longer repayment terms (The Lab, 2018).</p>	<p>LATM will have additional credit lines for integrated systems, agroforestry, and bioeconomy and will have a transition facility.</p>

Notes: Links to instruments [CRA Tabôa](#) and [Vox Regai 15.3 Regenerativo Fiagro](#).

2.3 CHALLENGES TO INSTRUMENT SUCCESS

The main challenges to instrument success relate to financial sustainability and risk management. It is essential to mention that some of these risks are typically related to any agricultural sector investment in Brazil.

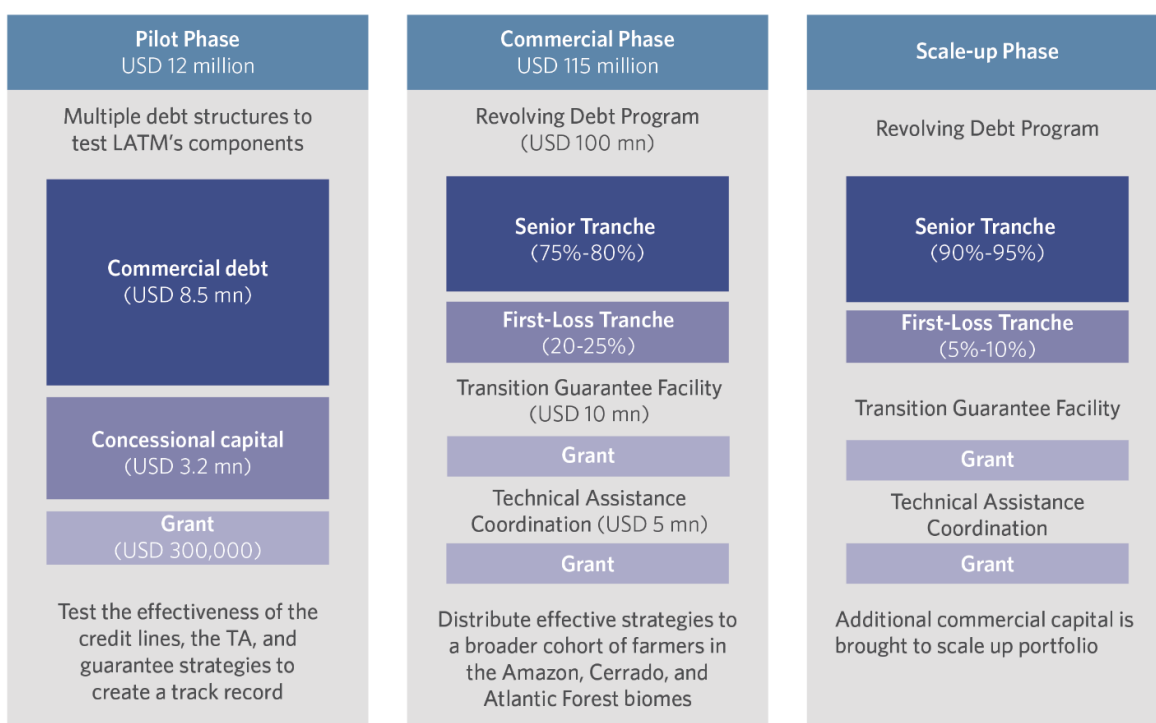
1. **Credit Risk:** Related to the farmer's capacity to repay loans and legal enforcement in case of default. This risk is dealt with through a well-designed credit policy (with ranges and applicable collaterals) and a network of commercial partners to support with due diligence.
2. **ESG Risk:** Related to farmers' non-compliance with the fund's criteria. This is addressed through ESG indicators and technical assistance linked to financial performance.
3. **Offtaker and Market Risk:** Related to market forecast and maintenance of offtake agreements. This is mitigated by working with well-established commercial partners.
4. **Traditional Agribusiness Activities:** Making degraded land available for productive systems can reduce the pressure for deforestation, and adopting a portfolio approach reduces the interest rates for sustainable practices such as agroforestry and bioeconomy. As low-carbon agriculture advances, leveraging integrated systems, agroforestry systems, and bioeconomy are expected to become more accessible.
5. **Grants and Concessional Capital Dependency:** The Transition Income Facility and Technical Assistance are funded through grants, while the Revolving Debt Program needs commercial de-risk by concessional capital. The need for de-risking capital is expected to reduce as investments in the sector increase. Additionally, premium payments by farmers and additional revenue streams, such as carbon credits and insetting, reduce dependency on concessional capital.
6. **Client Risk and Pipeline Development:** Some farmers are not ready or have no interest in adopting higher sustainable standards. The LATM pipeline will be informed by the proponents' current market track record and established relationships with commercial partners (see Annex I), which will be able to access a broad range of farmers with a performance track record.

MARKET TEST AND BEYOND

3. IMPLEMENTATION PATHWAY

Pilots summing up to USD 12 million will be implemented to test the concept and create a track record on the different components of this instrument. The complete instrument structure will seek USD 100 million for the Revolving Debt Program, USD 10 million for the Transition Guarantee Facility, and USD 5 million for Technical Assistance.

The implementation pathway is strategically divided into three distinct phases: the Pilot Phase, the Commercial Phase, and the Scaled-up Phase. Each of these phases is comprehensively detailed in the subsequent sections, offering a roadmap for the sequential progression of the financial instrument. The synthesis of these phases is succinctly illustrated in Figure 2, providing a visual representation of the overarching implementation strategy.



3.1 PILOT PHASE

Three pilots to test the Low-Carbon Agriculture Transition Mechanism's main components are set to target the Amazon and Cerrado biomes, representing 73% of Brazil's territory. Pasturelands, often unproductive and degraded, are abundant in both biomes (Figure 3).

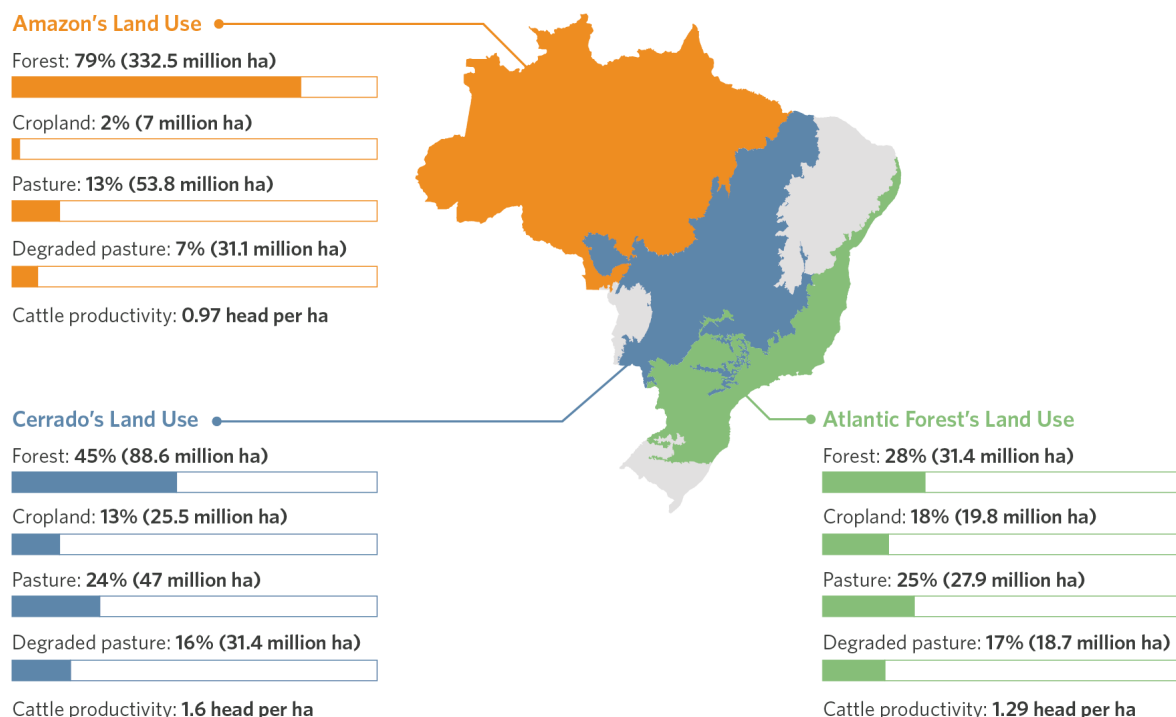
These degraded pastures present an opportunity to increase production by converting pastures to crop use or through pasture intensification. Both practices would move the attention from clearing new land to restoring land, reducing the harm to local biomes.

Between 2004 and 2012, Brazil reduced deforestation rates in the Amazon by 80% while the region's GDP in the agricultural sector increased by 50% (CPI, 2019). That means that

sustainable growth of the agricultural sector in Brazil while simultaneously curbing deforestation in Brazil, is feasible and depends on improving the allocation of land resources.

LATM's Pilot Phase is being implemented through Brazilian Asset-Backed securities called Agribusiness Receivables Certificates (CRAs) and credit funds (FIDCs and Fiagro) to demonstrate the instrument's potential to finance (1) pasture recovery; (2) bioeconomy for non-timber forest products; and (3) sustainable livestock management and integrated systems, as outlined in the following sub-sections. The details of this implementation phase can be found in Table 4.

Figure 2: Target Market



Notes: Areas in ha come from MapBiomas (2023). Cattlehead data comes from IBGE (2021).

3.1.1 PASTURE RECOVERY

This pilot focuses on investments to restore degraded pastureland and bioinputs for grains through funding. The pilot is being implemented in Cerrado through a CRA of BRL 15 million (USD 2.9 million). It targets 10,000 hectares of low-productive soy farms transitioning to sustainable systems while expanding to degraded pastureland.

3.1.2 BIOECONOMY – NON-TIMBER FOREST PRODUCTS

This pilot provides working capital to non-timber forest products (NTFP) sourcing associations, cooperatives, and family farmers through a CRA up to BRL 20 million (USD 3.9 million). It is part of Natura's Living Amazon Mechanism program. Natura, one of the world's largest cosmetics companies, has a long history of working with cooperatives in the Amazon, and this program aims to work with 12-15 cooperatives.

3.1.3 SUSTAINABLE LIVESTOCK MANAGEMENT AND INTEGRATED SYSTEMS

This pilot targets 5,000 Cerrado farmers with low-productive cattle areas transitioning to sustainable livestock management and expanding to degraded pastureland. Up to BRL 25 million (USD 4.9 million) CRA or FIDC is estimated to fund investments to restore degraded pastureland for sustainable cattle intensification. This proof of concept is a partnership with a producers' association from Mato Grosso.

Table 4 - Pilot deals

Characteristics	Pasture Recovery	Bioeconomy – NTFPs	Sustainable Livestock Management and Integrated Systems
Instrument Type	CRA	CRA	CRA or FIDC/Fiagro
Size Deal	BRL15 million (USD 2.9 million)	Up to BRL 20 million (USD 3.9 million)	Up to BRL 25 million (USD 4.9 million)
Term	40 months	Three years	Five years
Guarantees	Guarantee Agrogalaxy	Contract with Natura	Land
All-in producer cost of funds	CDI + 3.25% p.a.	Target of 9 % p.a.	CDI% + 2% p.a.
Series	Annual, after 12 months	Senior tranche – 50% / subordinated tranche – 50%	Senior tranche – 75% / subordinated tranche – 25%
Series Remuneration	Bullet	Senior tranche – CDI + 4% p.a./ subordinated tranche – Principal	Senior tranche – CDI + 4% p.a./ subordinated tranche – Principal
Interest Rate Payment	to be defined	to be defined	Semi-Annual, after 12 months
Principal Repayment	to be defined	Bullet	Annual, after 24 months
Hectares	10,000	to be defined	to be defined
Producers	18	-	to be defined
Region	Cerrado	Amazon	Cerrado / Amazon
Technical Assistance	Agrogalaxy	Funbio	A sponsor together with Imaflora
Income Guarantee	Producers receive an interest rate subsidy, but no income guarantee	No income guarantee, but concessional capital subsidizes interest rates.	No need for an income guarantee for producers, given it is an expansion of land

Note: Official FX conversion rates for BRL to USD from World Bank. Available [here](#). Exchange rate (Year – BRL/USD): 2022 – 5.16.

3.2 COMMERCIAL PHASE

The Commercial Phase will introduce the instrument structure described in Section 1. This phase will implement the Transition Guarantee Facility and apply the four credit lines from a portfolio risk management approach, which was modeled to offer lower interest rates for agroforestry and bioeconomy, activities usually more dependent on concessional capital when funded separately. This phase's target area will be the Amazon, Cerrado, and Atlantic Forest biomes, representing 86% of Brazil's territory. Together, the three biomes have 81,368,493 hectares of degraded pasture.

This phase relies on concessional and commercial capital, enabling the set-up of the initial portfolio. It aims to raise USD 100 million for the Revolving Debt Program, requiring 30% concessional debt for the first loss. USD 15 million in non-refundable grants will be necessary for Technical Assistance and the Transition Guarantee Facility.

3.3 SCALE-UP PHASE

After establishing the whole instrument structure, the instrument will advance to its Scaled Up Phase, where a reduced concessional capital amount is targeted for the first loss (around 5%-10%). As the model becomes financially sustainable, grants for Technical Assistance and Transition Guarantee Facility can be reduced based on (i) premium payments by the farmers (like in an insurance relationship) and (ii) additional revenue streams (such as carbon credits and insetting). The scale-up phase will be applied to different sectors and expand to different biomes.

4. FINANCIAL IMPACT AND SUSTAINABILITY

4.1 QUANTITATIVE MODELING

4.1.1 COMPARISON TO BUSINESS-AS-USUAL SCENARIO

Increasing private capital to complement public funding significantly impacted Brazil's agricultural investment evolution. The development of capital markets instruments such as agri-funds and specific agri-debt certificates improved the private capital inflows, reducing the dependency on bank loans and suppliers. However, most investments focus only on verifying legal requirements, which could lead to increased emissions or legal conversions of native forests. In addition, these investments tend to focus on crop-term financing, which prevents the capacity to fund a transition that would lead to adopting practices that will provide long-term returns.

Investments in the livestock sector could generate attractive returns, improve efficiency, restore degraded pastureland, and generate improved cash flows. Livestock productivity in Brazil is around 1.5 head of cattle per hectare of pastureland (MapBiomass, 2023 IBGE, 2021). This is associated with the fact that more than half of current pastures have some level of degradation. The production could more than double while maintaining forests intact.

LATM can improve livestock productivity while restoring pastureland for improved agriculture management. Even though there will be increased methane emissions due to the increased number of cattle, the correct management of the pastures leads to a high amount of carbon being sequestered from the atmosphere and stored in the soil (FGV Agro, 2022; Domiciano, Leandro F. et al. 2020; De Stefano, A. & Jacobson, M.G, 2017).

4.1.2 MODEL INPUTS AND METHODOLOGY

The instrument is modeled as a 10-year facility with four credit lines. The estimated loan sizes and terms for each line reflect the specific needs of the rural producers regarding the type of production targeted (e.g., restoring degraded pasture land and improving livestock productivity).

LATM aims to facilitate credit access to sustainable agriculture, complementing government-subsidized loans and addressing gaps for additional investments for an appropriate sustainable transition.

The interest rates are set to provide competitive terms to farmers while fulfilling the return expectations of private and concessional investors. Expected default rates were obtained from a research of sector averages, with specific considerations for each credit line.

Table 5 - Credit Lines Modeling

Credit Lines	Interest Rate (p.a.)	Interest Rate Type	Default Rate (p.a.)	Allocation
Pasture Recovery	15.35%	Compound DI+	2.00%	40%
Sustainable Livestock Intensification	13.65%	Compound DI+	1.50%	30%
Integrated Systems	13.65%	Compound DI+	1.75%	20%
Agroforestry and Bioeconomy	11.00%	Fixed	5.00%	10%

Note: DI rate is the average rate of interbank transactions carried out through interbank certificates of deposits. The average DI rate for the first semester of 2023 stood at 13.65%.

In order to prove the concept, the proponents already structured and will be structuring specific debt deals related to each credit line and similar conditions (see section 3).

4.2 PRIVATE FINANCE MOBILIZATION AND SCALE-UP POTENTIAL

The fund is expected to raise USD 115 million, with USD 100 million allocated to the Revolving Debt Program, USD 10 million to the Transition Guarantee Facility, and USD 5 million to Technical Assistance. Commercial capital is estimated to account for 60% of the total raised amount. In contrast, concessional capital accounts for 26% of de-risking the credit fund, and grants account for 13% of the transition facility and the technical assistance.

The instrument is expected to reach 78,000 hectares by 2030, equivalent to the New York City area, with a total capitalization of USD 196 million.

Table 6 summarizes how the capital is structured, the returns to investors, and the use of proceeds.

Table 6 - Types of Capital Targeted and Returns

Type of Capital	Total Amount (USD)	IRR (USD)	Use of Proceeds
Senior	50 MN (43%)	15.74%	Loan portfolio
Mezzanine	20 MN (17%)	18.00%	Loan portfolio
Subordinated	30 MN (26%)	4.40%	Loan portfolio
Grants	5 MN (4%)	-	Technical Assistance
	10 MN (9%)	-	Transition Facility
Total	115 MN	-	-

The dependency of concessional capital for de-risk purposes is targeted to be reduced to 5%-10% based on a commercial investor perspective. Grants for technical assistance could be partially replaced with structures provided by commercial partners. In addition, an insurance mechanism could replace grants to the transition facility with premium payments, or the amounts used by the farmers could be repaid using additional cash flows, such as the funds from carbon credits commercialization.

To increase the technical assistance's impact and develop the instrument to reduce dependency on grants and concessional capital, the farms' soils will be assessed to establish a baseline and verify how it evolves toward the fund's development.

This model could be scaled up in all of Brazil's degraded pasturelands (95.5 million hectares - MapBiomass, 2023), optimizing them into low-carbon agriculture and transforming current traditional practices, furthering into a more regenerative approach. Apart from Brazil, this model could also be replicated in other geographies to address the same issues of degraded pastureland and conventional agricultural practices.

5. ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACT

Deforestation and Conversion Free (DCF) investments with impact on reduced emissions, soil improvement, and increased income for farmers

The mechanism aims to deliver sustainable returns based on changes in usual industrial commodities production or small-scale agriculture. It focuses primarily on climate change mitigation by restoring degraded pastureland, avoiding deforestation and degradation, and improving agricultural practices. However, it also addresses adaptation issues through practices that restore soil health and make the areas resilient to temperature and rainfall pattern changes. Table 7 provides a comprehensive view of how this aim could be achieved.

Regarding the social dimension, the insights provided by Table 8 shed light on the effects of gender equality, the size of rural producers, and the enhancement of income levels. These indicators underscore the broader societal transformation the instrument concept brings under consideration.

LATM is aligned and contributes to achieving several of the UN Sustainable Development Goals (SDGs), including:



SDG 15: Life on Land. By maintaining native forests through the financing of restoration of pasturelands, agroforestry, and bioeconomy, the Mechanism will support the quality and health of soil and water resources, as well as the maintenance of biodiversity.



SDG 13: Climate Action. The mechanism aims to decrease the pressure to deforest significantly, thus preserving standing forests with the potential to sequester in the commercial phase, over 5.6 million tons of carbon. Besides mitigation efforts, the mechanism will also contribute to farmers' climate adaptation capacity and resilience.



SDG 8: Decent Work and Economic Growth. The mechanism will contribute to better financial conditions and access to affordable credit lines for small and medium producers, thus enabling them to maintain work and grow their economic activities.



SDG 2: Zero Hunger. The mechanism will increase small and medium-sized farmers' agricultural productivity and income through access to credit and technical assistance. It will also promote sustainable food production systems and resilient agricultural practices that increase productivity and production, help maintain ecosystems, strengthen resilience to climate change, extreme weather, drought, flooding, and other disasters, and progressively improve land and soil quality.

5.1 ENVIRONMENTAL IMPACT

In its commercial phase, LATM will target 78,000 hectares: 33,000 for Pasture Recovery, 25,000 for Sustainable Livestock, 8,000 for Integrated Systems, and 12,000 for Agroforestry and Bioeconomy.

Table 7: Commercial Phase Potential - Environmental Impact

Credit Line	Pasture Recovery	Sustainable Livestock	Integrated Systems	Agroforestry & NTFP	Total
Total Area (ha.)	33,161	24,870	8,290	11,843	78,164
Amazon	-	-	1,244	8,290	9,534
Cerrado	33,161	24,870	5,389	-	63,420
Atlantic Forest	-	-	1,658	3,553	5,211
Carbon (tCO₂eq/yr)	49,741	46,757	19,689	71,059	187,245
REDD+	36,477	21,886	7,254	-	65,617
Sustainable farming-ranching	13,264	24,870	12,435	-	50,570
Reforestation	-	-	-	71,059	71,059

5.2 SOCIAL AND ECONOMIC IMPACT

The estimated number of farmers targeted by the commercial phase is 3,659, with 23% female farmers.

Table 8: Commercial Phase Potential - Social and Economic Impact

Credit Line		Pasture Recovery	Sustainable Livestock	Integrated Systems	Agroforestry & NTFP	Total
Number of Producers		53	27	27	3,552	3,659
Size	Small	40 (up to 500ha)	20 (up to 750ha)	20 (up to 250ha)	2,960 (up to 2ha)	3,040
	Medium	13 (up to 1000ha)	7 (up to 1500ha)	7 (up to 500ha)	592 (up to 10ha)	619
Gender	Male	41	20	20	2,736	2,817
	Female	12	6	6	818	842
Production and Income Outcomes						
		50% increase of 60-kilogram bag per ha (to 60 from 40)	150% increase of livestock units per ha (to 3 from 1.2)	50% increase of 60-kilogram bags per ha (to 60 from 40) + 150% increase of livestock units per ha (to 3 from 1.2)	Increase of up to 40% in income 5,259 total impacted lives 5,472 total impacted lives	

The size of producers was based on the type of activity, whether industrial or familiar scale and region.

NEXT STEPS

The proponents will further enhance their collaborations with off-takers and pipeline originators in the upcoming stages, fostering stronger connections and contributing to the instrument's success. This will induce the development of Pilot Phase and Commercial Phase pipelines. As for the mobilization of capital, proponents will pursue funding from private, concessional, and philanthropic investors. To finally implement the structures developed, it will hire lawyers, audit experts, and consulting firms to ensure support and seamless execution.

REFERENCES

- Agroanalysis. 2022. Plan Safra 2022/2023. Agroanalysis v.42 n.8 (2022): August, Fundação Getúlio Vargas (FGV), Rio de Janeiro. Reference [Link](#).
- Brazil. 2015. Intended Nationally Determined Contribution: Towards Achieving The Objective Of The United Nations Framework Convention On Climate Change. Federative Republic of Brazil. Reference [link](#).
- Brazil. 2022. Paris Agreement: Nationally Determined Contribution (NDC). Federative Republic of Brazil. Reference [link](#).
- CPI. 2019. "Why Is Protecting the Amazon Important?". Climate Policy Initiative (CPI), Rio de Janeiro. Reference [link](#).
- CPI. 2020. Rural Credit Policy in Brazil: Agriculture, Environmental Protection, and Economic Development. Climate Policy Initiative (CPI), Rio de Janeiro. Reference [Link](#).
- CPI. 2021. The Impact of Rural Credit on Agriculture and Land Use: an Analysis of Brazilian Biomes. Climate Policy Initiative (CPI), Rio de Janeiro. Reference [Link](#).
- Source: CPI. 2023. Contributions to Sustainability in the Brazilian Agricultural Plan 2023/24. Climate Policy Initiative (CPI), Rio de Janeiro. Reference [Link](#).
- De Stefano, A. & Jacobson, M.G. 2017. Soil carbon sequestration in agroforestry systems: a meta-analysis. Reference [Link](#).
- Domiciano, Leandro F. et al. 2020. Agroforestry systems: an alternative to intensify forage-based livestock in the Brazilian Amazon. Reference [Link](#).
- Eurostat, 2023. Agri-environmental indicator – livestock patterns. Reference [Link](#).
- FGV Agro, 2022. Panorama das Emissões de Metano e Implicações e Implicações do Uso de Diferentes Métricas. Boletim informativo nº 4/2022. FGV EESP, FGV Agro, Centro de Estudos do Agronegócio. Reference [Link](#).
- Ritchie, H., Roser, M., & Rosado, P. 2022 - "CO₂ and Greenhouse Gas Emissions". Published online at OurWorldInData.org. Reference [Link](#)
- IBGE. 2021. Produção da Pecuária Municipal 2021. Instituto Brasileiro de Geografia e Estatística (IBGE), Rio de Janeiro. Reference [Link](#)
- MAPA. 2023a. Plano Safra disponibiliza BRL 340,8 bilhões para incentivar a produção agrícola nacional. Ministério da Agricultura e Pecuária (MAPA), Brasil. Reference [Link](#).
- MAPA. 2023b. Valor Bruto da Produção Agropecuária de 2023 é estimado em BRL 1,216 trilhão. Ministério da Agricultura e Pecuária (MAPA), Brasil. Reference [Link](#).
- MapBiomas. 2023. MapBiomas Project- Collection version 7.1 of the Annual Series of Land Use and Land Cover Maps of Brazil, accessed on 27/07/2023. Reference [Link](#).
- Oliveira, W., Souza, P., & Stussi, M. 2023. Plano Safra traz avanços ambientais, mas deixa lacunas. Valor Econômico, São Paulo. Reference [Link](#).

SEEG. 2022. Análise das emissões brasileiras de gases de efeito estufa e suas implicações para as metas climáticas do Brasil 1970 – 2020. Sistema de Estimativas de Emissões e Remoções de Gases de Efeito Estufa (SEEG). Reference [link](#).

The Lab. 2021. Amazônia Sustainable Supply Chains Mechanism. The Lab, Climate Policy Initiative (CPI), San Francisco. Reference [link](#).

The Lab. 2020a. Conexsus Impact Fund. The Lab, Climate Policy Initiative (CPI), San Francisco. Reference [link](#).

The Lab. 2020b. Sustainable Agriculture Facility. The Lab, Climate Policy Initiative (CPI), San Francisco. Reference [link](#).

The Lab. 2018. Responsible Commodities Facility. The Lab, Climate Policy Initiative (CPI), San Francisco. Reference [link](#).

ANNEX I – LATM COMMERCIAL PARTNERS

Credit Lines	Commercial Partners	Stage of Development
Pasture Recovery	AgroGalaxy - Green Galaxy Program	Running since 2022
	Large Trading Companies	Pilot definition
	Large Input Companies	Pilot definition
Sustainable Livestock Intensification	Farm Association	Prospection
	Large Input Companies	Prospection
	Large Animal Protein Companies	Pilot definition
Integrated Systems	Large Farming Operators	Prospection
	Bank Cooperatives	Pilot definition
Agroforestry and Bioeconomy	Funbio	Structuring
	Startups	Prospection
	Natura	Structuring